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October 2001

Russia

Russia is important to world energy markets because it holds the world's largest natural gas reserves, the second largest coal reserves, and the eighth largest oil reserves. Russia is also the world's largest exporter of natural gas, second largest oil exporter, and second largest energy consumer.

Note: Information contained in this report is the best available as of October 2001 and is subject to change.



GENERAL BACKGROUND

Russia's economy is in the best shape it has been since the collapse of the Soviet Union nearly ten years ago. The steep depreciation of Russia's currency, the ruble, in the aftermath of the August 1998 financial crisis increased the competitiveness of Russian exports, and a sharp rise in oil prices in 1999-2000, along with increased political stability following the election of Vladimir Putin as president in March 2000, allowed the

country to enjoy its strongest economic growth in a decade. Buoyed by surging oil export revenues, Russia's real gross domestic product (GDP) grew 8.3% in 2000. The windfall in oil export revenues in turn stimulated increases in other industrial sectors and helped the Russian government pay down some of its \$158 billion foreign debt. Meanwhile, Russia experienced a current account surplus, and the country's rate of inflation slowed from 36.5% to 20.2% in 2000.

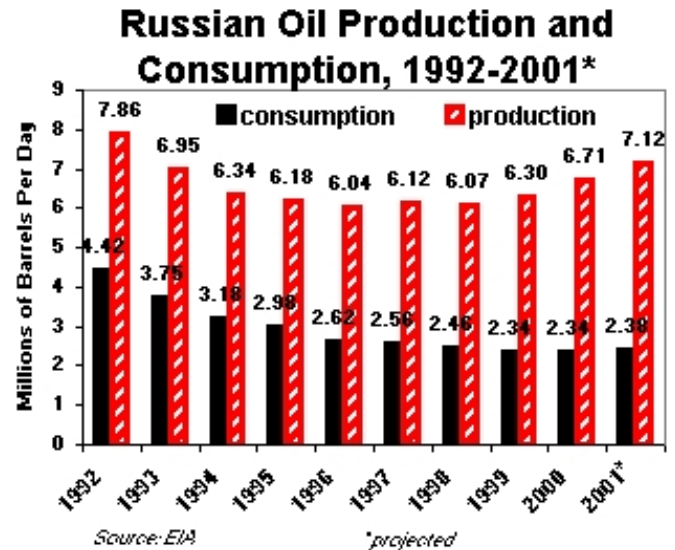
Because energy accounts for 40% of Russia's exports and 13% of GDP, Russia's economy is extremely sensitive to global energy price fluctuations. Analysts are worried that the drop in world oil prices in 2001 could be harmful to Russia's economy. Inflation in May 2001 was running at 25% year-on-year, and Russia's GDP, while still predicted to grow in 2001, is now predicted to slow to a 4.7% increase. President Putin's economic adviser Andrei Illarionov publicly lambasted the government for squandering Russia's massive oil windfall, saying it could have managed the oil dividend far better. Sources say that Illarionov made the comments because he is concerned that structural reforms have ground to a halt in the euphoria of the oil revenues.

[Restructuring the energy sector](#) and making the Russian economy less dependent on has become a priority

for President Putin. The Russian [oil and gas exports](#) president has made a crackdown on corruption the focal point of his presidency thus far, seeking to erode the power of the oligarchs and further restructure and liberalize Russia's economy. To that end, the Russian government has made plans to break up the monopoly positions of both Gazprom and Unified Energy Systems, the Russian natural gas and electricity monopolies, respectively. Similarly, Putin's government is taking actions to improve the investment climate in Russia in an attempt to court foreign investors to the country. Russia has plans for a number of [new oil and gas pipelines](#), and massive infrastructure investments will be needed to develop several planned [international oil and gas projects](#).

OIL

After several years of decline following the collapse of the Soviet Union, Russia's oil industry has bounced back in the past few years, posting strong profits and healthy increases in production. Russia is one of the world's biggest oil producers, but from 1992 to 1998, the country's oil production plummeted 23% due to decreased domestic industrial demand and a decline in drilling and capital investment. Buoyed by high world oil prices in 1999-2000, Russian oil companies reinvested much of their generous profits into ramping up crude production. Since 1998, when production bottomed out at 6.07 million barrels per day (bbl/d), Russia's oil production, including condensates, increased 10.5%, to 6.71 million bbl/d in 2000. Analysts are forecasting another 6% year-on-year increase in total Russian oil production for 2001.



Russia has an estimated 49-55 billion barrels in proven oil reserves, but aging equipment and poorly developed fields are making it difficult to develop these reserves. In addition, a recent report stated that, as of 1999, Russia was producing around 2 million bbl/d more crude oil than it had discovered in new reserves. The industry faces the depletion of existing oilfields, deterioration in transport infrastructure, and an acute shortage of investment due to the confusing tax and legal environment. Large amounts of capital will be needed to develop new fields and to extend the life of existing oilfields with exhausted and low-yield reserves.

The sharp rise in oil prices during 1999-2000 provided Russian oil companies with a windfall in revenues, giving them strong incentive to upgrade decaying oil infrastructure and to undertake new exploratory drilling. In addition to further development of the West Siberia region, Russian oil producers are conducting more exploration in the Russian sector of the [Caspian Sea](#), and teaming up with foreign oil producers to develop [oil projects in the Arctic region, Eastern Siberia, and Sakhalin Island](#) in Russia's Far East. Russia's future level of oil production will be defined by the ability of oil companies to develop these new deposits, which will require a massive amount of infrastructure investment in order to deliver this oil to customers.

Oil Sector Reform

Russia [reorganized its state-run oil industry](#) into a number of vertically-integrated oil companies in the early 1990s, and the state has divested itself of large stakes in most of these companies. Nonetheless, foreign investment in the industry has been minimal due to economic and political instability, a poor record of corporate governance, and the unstable legislative framework. In order to create a more stable investment climate, potential investors have called upon the Russian government to undertake further reform, including the establishment of cohesive production-sharing agreement (PSA) framework legislation. Although the political and economic situation has stabilized since the August 1998 financial crisis, and high world oil prices in 1999-2000 enticed some investors into Russia, others are still awaiting

the passage of a new Russian PSA regime and tax code.

Oil Exports

Despite the relative lack of foreign investment in its oil sector, [Russia remains one of the world's major oil exporters](#). After slumping in the mid-1990s, the ruble devaluation of August 1998 cut production costs sharply for Russian oil exporters, and the climb in world oil prices in 1999-2000 made exports even more profitable for Russian oil companies. With domestic consumption of 2.34 million bbl/d in 2000, Russia's net oil exports in 2000 were approximately 4.37 million bbl/d, making Russia the world's second largest oil exporter, behind only [Saudi Arabia](#). Of this 4.37 million bbl/d in exports, nearly 87% (3.8 million bbl/d) went to countries outside the former Soviet Union (FSU).

Russia is not a member of the Organization of Petroleum Exporting Countries ([OPEC](#)), but in recent years it has frequently attempted to coordinate its export strategy with OPEC. However, while OPEC has cut production quotas three times so far in 2001, for a total of 13% percent of daily output, Russia has increased production by 410,000 bbl/d, or 6%--faster than any other [non-OPEC](#) country. Russian government officials have levied higher export tariffs and set export quotas in order to limit the country's oil exports, but thus far the strategy has not worked because the Russian domestic oil price is only half the world oil market price. In 2001, Russia's net oil exports are projected to increase to 4.74 million bbl/d.

Oil Pipelines

Russia's oil exports could be even higher if they were not restricted by a lack of spare capacity in existing export pipelines. Currently, Russia's main export pipeline--the 1.2-million-bbl/d-capacity Druzhba pipeline--is operating at its highest capacity in years. In addition, many of the country's oil pipelines are in a state of disrepair, and Russian Energy Ministry figures indicate that almost 5% of crude oil produced in Russia is lost through illegal tapping of Russia's pipelines. With a windfall in oil export tariffs in the past several years, Transneft, the state oil transport monopoly, has taken steps to upgrade the country's pipeline system, with an emphasis on building [new export pipelines](#) to increase and diversify export routes for oil exporters. In addition to constructing the [Baltic Pipeline System](#) and a possible [pipeline to China](#), Transneft is seeking to lure additional [oil from Kazakhstan and Azerbaijan to transit Russia](#).

Downstream/Refining

Russia has 37 refineries--many of which are inefficient, aging, and in need of modernization--with a total processing capacity of 6.6 million bbl/d. With Russian domestic demand of 2.34 million bbl/d in 2000, refining capacity far outstrips demand for refined products. In addition, because a barrel of crude oil on the Russian market goes for just over half the world price, many oil companies prefer to export their crude oil rather than refine it in Russia and then export the petroleum products. When Russian oil producers do not export their crude oil--often because of the constraints of Russia's pipeline system--many choose to supply their own refineries rather than sell the oil on the open market.

The Russian government has attempted to ensure deliveries to refineries by making access to export pipelines for oil producers conditional on meeting their delivery targets to refineries. As a result, Russian refineries are receiving more deliveries in the past few years: according to Russia's Energy Ministry, refinery processing reached 3.58 million bbl/d in the first half of 2001, which represents a 4% increase compared to the same time period in 2000. Still, many refineries are operating well below capacity. Although financial constraints prevent most refineries from undertaking renovation efforts, those that have the financial means are using downtime to undergo efficiency upgrades. Russian oil giant Lukoil recently completed the first \$700-million phase of its 220,000-bbl/d Volgograd refinery modernization, and the 290,000-bbl/d Yaroslavl refinery is currently being renovated.

NATURAL GAS

Russia contains the world's largest supply of natural gas, with over 1,700 trillion cubic feet (Tcf) in proven reserves. Gazprom, the state-run gas monopoly, produces nearly 94% of Russia's natural gas, operates the country's 90,000-mile gas pipeline grid and 43 compressor stations, and holds nearly one-third of the world's natural gas reserves. In addition, Gazprom is Russia's largest earner of hard currency, and its tax

payments account for around 25% of federal government tax revenues.

Natural gas accounts for over 54% of Russia's energy consumption, but the country's gas production still far exceeds domestic demand. In 1999, Russia consumed 14 Tcf of natural gas while it produced 20.8 Tcf. With 6.8 Tcf in net [gas exports](#), Russia retained its position as the world's largest natural gas exporter.

Russia's natural gas production has decreased only 8% from 1992, but although it has not been as hard hit as other sectors of the energy industry during the transition to a market economy, low investment in Russia's gas sector has raised concerns about future production levels. Production in the gasfields in the Yamal-Nenets region of northern West Siberia (Urengoi, Yamburg)--where most of Russia's gas output comes from--is declining, while the planned development of new fields continues to be delayed as a result of lack of investment resources.

Gazprom is responsible for future development of giant Bovanenkovskoye field on the Yamal Peninsula and other fields in the Yamal-Nenets region, including the the giant Pestsovoye and Zapolyarnoye fields to the north in the Ob-Taz Gulf area. Gazprom, through its subsidiary Rosshelf, also is responsible for development of the Shtokmanovskoye gas field in the Barents Sea and other fields in the North Caucasus, Precaspian, Timan-Pechora, and the Volga-Urals. As a result of the approximately \$2.7 billion debt of domestic gas consumers, Gazprom has been unable to invest adequately in new fields, many of which need major infrastructure requirements. Development of the Bovanenkovskoye, Shtokmanovskoye, and Zapolyarnoye super-giants needs massive levels of investment. Thus, [Gazprom is looking to establish partnerships with foreign investors to develop several gas production projects](#).

Restructuring the Gas Sector

In addition to chronic non-payments by consumers, Gazprom continues to be hurt by low domestic prices for natural gas. The company currently is forced by the Russian government to sell gas to domestic users for \$12-14 per thousand cubic meters, less than it costs to produce, while the export price is \$130-\$150 per thousand cubic meters. In an attempt to liberalize the country's gas industry, President Putin has taken steps to [restructure the gas sector](#) and end Gazprom's monopoly position. On November 9, 2000, the government ordered Gazprom to give other companies the right to use up to 15% of its pipeline capacity, and in May 2001, Gazprom's Board of Directors ousted long-time chief Rem Vyakhirev and replaced him with Aleksei Miller, an ally of Putin.

Vyakhirev's replacement appears to signal that the Russian government is serious about gas market reform. A restructuring plan currently under consideration would [break Gazprom's upstream operations into separate producing companies](#) in order to foster competition on the Russian domestic market, while the government would take control of Gazprom's transmission pipeline, offering [equal access to all gas producers](#). The lack of pipeline access deters the production of associated gas by Russia's oil companies, who have preferred to flare off the gas instead. In addition, the Russian government appears to be paying heed to Gazprom's minority shareholders, calling for an investigation into [alleged asset stripping](#) and an explanation of Gazprom's mysterious relationship with Itera, a gas trading company that has rapidly become Russia's second-largest gas exporter.

Natural Gas Exports

The Russian government's determination to keep domestic gas prices artificially low forces Gazprom to look abroad for hard-currency earnings. Thus, Russia's gas industry is heavily dependent upon [natural gas exports](#), which currently are subject to a 10% export tariff. In 1999, Russia had net natural gas exports of 6.8 Tcf, the majority of which were sent to customers outside the FSU. Gazprom supplies Europe with 25% of its natural gas, and with [several new pipelines](#) planned or already under construction, Russia hopes to increase this percentage in the next decade. In order to boost its export potential in 2001, Gazprom, via gas trader Itera, contracted in February 2001 to buy 353 Bcf of gas from [Turkmenistan](#) this year.

Russian independent Arktikgaz has been given access to Gazprom's pipeline network to supply 4.2 billion cubic feet (Bcf) of gas to northern [Ukraine](#) from October 2001-2010. Arktikgaz also has signed contracts to

supply 5.3 Bcf to [Belarus](#) and 2.1 Bcf to [Georgia](#) over the next 10 years and hopes to become the first Russian independent producer to export gas outside the former Soviet Union. While these figures are minuscule compared to the amount of gas that Gazprom exports, it represents the first challenge to Gazprom's monopoly position on Russian gas exports. Further restructuring of the gas sector and the potential break-up of Gazprom could open the export market to additional producers.

Gas Pipelines

In an effort to diversify its export routes and reach new markets, Russia is planning to build several [new gas export pipelines](#). The [Blue Stream pipeline](#) to [Turkey](#) is the centerpiece of Russia's export diversification strategy. The pipeline, which will supply Turkey with 565 Bcf of gas via twin pipelines on the bottom of the Black Sea, is nearing completion, with only the subsea portion of the pipeline left to be laid. Russia's dispute with Ukraine over natural gas transit and unsanctioned removal of gas has prompted Gazprom to propose building a new "[Ukraine bypass](#)" pipeline that would complement Yamal-Europe I and other gas pipelines supplying European customers. In addition, Russia is looking eastwards, with several potential [gas pipelines to China](#) currently in the works.

COAL

The transition of Russia's coal industry from a massively-subsidized industry into a streamlined, profitable operation--with potential for growth--is almost complete. Years of poor management of the coal sector during the Soviet era, combined with a sharp decline in demand for coal during the early 1990s, significantly undermined the sector's economic viability, and by 1993, government subsidies to the coal sector became unsustainably high, exceeding 1% of the country's GDP, according to the World Bank. In 1992, Russia produced 406 million short tons of coal (Mmst), but that figure had slumped to 257 Mmst by 1998, a decline of 37%.

However, Russia initiated a [comprehensive restructuring of the coal sector](#) in the mid-1990s, and with over \$1.3 billion in financial assistance provided by the World Bank, the restructuring efforts are showing significant results. After years of decline, Russia's coal production increased to 276 Mmst in 1999, and preliminary figures for 2000 show that production remained steady. The country's State Statistics Committee reported in August 2001 that Russia produced 4.3% more coal in the first seven months than in the same period of 2000, with exports during the same time period up 30% year-on-year. Coal exports to the Commonwealth of Independent States (CIS) and Baltic states were down 24.6% compared to the same time period in 2000, but exports to countries outside the CIS and Baltics went up 41.5%.

In addition, the state coal company, RosUgol, has been phased out, and production subsidies are set to end this year, and mines with no economic future are scheduled for closure this year. Coal accounted for just 16% of Russia's domestic energy consumption in 1999, but with Russia's commitment to earning hard currency through [oil and gas exports](#), the Russian government is looking to boost that level to as high as 28%. Imported coal from China may supplement Russia's coal production, but since Russia has approximately 173 billion short tons in coal reserves, the majority of the increased output will come from domestic sources. Russia's recently published energy strategy calls for coal production to climb to 335 Mmst in 2010 and then to 430 Mmst in 2020.

ELECTRICITY

Russia's mammoth power sector, which includes over 440 thermal and hydropower plants, plus 29 [nuclear reactors](#), has a total electric generation capacity of 204 gigawatts (GW). With 139 GW of production capacity, thermal power (oil-, gas-, and coal-fired plants) accounts for 68% of the country's power generation capacity, while hydropower plants account for an additional 44 GW (21.5% of total installed power capacity). Russia's electricity sector is controlled by Unified Energy Systems (UES), which is 52%-owned by the Russian government. UES, headed by former privatization minister Anatoly Chubais, controls approximately 70% of the country's distribution system and oversees Russia's 72 regional electricity companies, called *energос*.

Russia shut down several nuclear reactors during the 1990s, leading to a drop in the country's power-

generating capacity during the last decade from 213 GW in 1992. Nonetheless, Russia still has sufficient power production potential to supply domestic consumers, as well as [export power](#) to other countries. In 1999, Russia's total electricity generation broke a decade-long downward trend by inching up from 786 billion kilowatt-hours (Bkwh) produced in 1998 to 798 Bkwh.

Similarly, the economic recovery after the August 1998 financial crisis resulted in a slight increase in the country's total electricity consumption, rising to 728 Bkwh in 1999 from 713 Bkwh the year before. Increased industrial demand for electricity also has forced power stations to operate at higher capacity, straining power companies' ability to procure fuel supplies at a time when Gazprom is continuing to reduce gas supplies to UES. A lack of fuel supplies at power stations has already led to periodic power outages.

Electricity Sector Restructuring

Russia's power sector is in serious need of reform. Much of the sector is obsolete by Western standards, and Russia lacks the money to pay for necessary maintenance. Currently, UES has only \$1 billion per year to invest in maintenance and modernization efforts. Analysts have estimated that if rates of investment stay at present levels, 32% of the current stock of electricity generating equipment will be out of commission by 2005, prompting a crisis in electricity production that may lead to widespread regional power shortages. The power sector's investment needs over the next decade range between \$5 billion and \$10 billion per year.

Numerous reform plans have been debated over the past several years, to no avail. However, the severe power outages in Russia's Far East during the winter of 2000-2001 have made power sector restructuring a high priority. In May 2001, the Russian government approved a [blueprint for electricity sector restructuring](#) that, over the course of the next several years, would break up UES into separate generation and transmission and distribution units. Russian officials hope this will pave the way for privatization of independent power-generating companies and thereby attract much needed investment to the sector.

Electricity Exports

UES has begun to focus on electricity exports in order to increase its cash flow to allow it to procure fuel supplies, as well as invest in maintenance and modernization projects. In October 2000, UES began to supply electricity to Europe as part of an international project to create an "East-West energy bridge." UES is participating in the Baltrel program to create an energy ring with power companies in the Baltic states, and it has also signed contracts to export power to Turkey via Georgia. In addition, in August 2001 the Ukrainian and Russian electricity grids were re-connected, allowing Russia to export electricity to Ukraine as well as Moldova.

Nuclear

Russia now operates 29 nuclear reactors in nine locations, all west of the Ural mountains. The country has a total installed nuclear capacity of 21 GW, and in 1999 Russia's nuclear plants generated 111 Bkwh of power, accounting for 14% of the country's total electricity generation. However, Russia's nuclear power plants are aging, and the nuclear power industry has been hard hit by the transition to a market economy. Russia already has shut down 4 reactors that were older than 30 years (the maximum prescribed service life for a reactor), but 15 of the country's 29 operating units are over 20 years old, and by 2005, seven of those reactors will have been in service for 30 years. No new power plants have been built in the country since 1990 due to the nuclear industry's lack of funding.

With Russia's plans to [export more natural gas](#) to the West, the country is planning to increase its use of nuclear power to meet its domestic electricity needs. In order to do so, additional capacity will be needed, but the nuclear industry's lack of funding has forced Minatom, the government agency responsible for overseeing the country's nuclear power plants, to focus on extending the service life of existing units instead. Safety issues are an ongoing concern, especially with regard to the 16 relatively old reactors of the RBMK design used at Chernobyl. Older RBMK units at Kursk and St. Petersburg are to be overhauled and equipped with stopgap safety improvements to prolong their lives for another three decades.

Minatom is hoping to complete construction on five nuclear reactors that have been under construction since the 1980s and to build 25 new ones over the next 20 years. In February 2001, Russia's Deputy Minister of Atomic Energy, Bulat Nigmatulin, said the ministry would finance most of the \$1.5 billion necessary to complete the construction of the five reactors by 2005. The 1,000-MW Rostov-1 reactor, the 1,000-MW Kalinin-3 reactor, and the 1,000-MW Kursk-5 reactors, all begun during the 1980s, are nearly operational, but Western nuclear experts have expressed doubts that Russia can finance the construction of 25 additional reactors on its own.

To increase its ability to finance domestic nuclear projects, in October 2000 Russia announced plans to market nuclear power plants to countries in Asia and Africa. The first of such plants, a \$1.2-billion project for two 1,000-MW reactors, was sold to [India](#) to be installed near Chennai by 2008. Russia also negotiated a similar deal with [Iran](#) to build the Bushehr nuclear power plant. According to the International Atomic Energy Agency, Russian-designed reactors would not be licensable in Western countries because they do not have all of the mandatory safety features, such as a containment dome.

ENVIRONMENT

After years of neglect under the Soviet Union, the state of the [environment](#) has become a pertinent issue in today's Russia. Soviet policies that encouraged rapid industrialization and development left a legacy of [air pollution](#) and [nuclear waste](#) with which Russia now is struggling to contend. Although environmental awareness in Russia is rising, the cost of remediating the country's environmental hotspots is high, and the newly created Ministry of Natural Resources has a limited budget. As a result, cleanup has been slow, and environmental protection has not been a top priority.

The economic contraction in the aftermath of the Soviet Union's collapse caused a drop in industrial production, resulting in less [energy consumption](#) and a drop in Russia's [carbon emissions](#). However, [energy and carbon intensities](#) in Russia remain high, and while [per capita carbon emissions](#) have fallen over the last decade, as production has picked up since the August 1998 financial crisis, Russia will need to pursue more sustainable environmental policies in the [21st century](#) in order to maintain this trend. Although it has abundant natural energy resources, Russia will need to look increasingly toward renewable energy options and cleaner environmental technologies in order to preserve its natural wonders.

COUNTRY OVERVIEW

President: Vladimir Vladimirovich Putin (since December 31, 1999)

Prime Minister: Mikhail Mikhaylovich Kasyanov

Independence: August 24, 1991 (from Soviet Union). National holiday: Independence Day, June 12, 1990

Population (7/01E): 146 million

Location: Eurasia

Size: 6,592,850 sq. mi., slightly more than 1.8 times the size of the United States

Major Cities: Moscow, St. Petersburg, Yekaterinburg, Irkutsk, Murmansk, Yakutsk, Vladivostok

Languages: Russian, others

Ethnic Groups: Russian (81.5%), Tatar (3.8%), Ukrainian (3%), and 100 other nationalities (11.7%)

Religions: Russian Orthodox, Muslim, other

ECONOMIC OVERVIEW

Minister of Finance: Aleksey Leonidovich Kudrin

Currency: Ruble

Market Exchange Rate (10/12/01): \$1 = 29.55 rubles

Nominal Gross Domestic Product (GDP) (2000E): \$623.1 billion

Real GDP Growth Rate (2000E): 8.3%; **(2001E):** 4.7%

Inflation Rate (Change in Consumer Prices, Dec. 1999-Dec. 2000E): 20.2%; **(2001E):** 18.9%

Official Unemployment Rate (2000E): 10.5%; **(2001E):** 9.1%

Current Account Balance (2000E): \$46.3 billion; **(2001E):** \$39.1 billion

Major Trading Partners: Belarus, Germany, Ukraine, United States, Kazakhstan

Merchandise Exports (2000E): \$87 billion

Merchandise Imports (2000E): \$36.3 billion

Merchandise Trade Balance (2000E): \$40.7 billion

Major Exports: Petroleum and petroleum products, natural gas, wood and wood products, metals, chemicals, various civilian and military manufactures

Major Imports: Machinery and equipment, consumer goods, medicines, meat, grain, sugar, semifinished metal products

External Debt (2000E): \$158 billion

ENERGY OVERVIEW

Minister of Energy: Igor Khanukovich Yusufov

Minster of Atomic Energy: Aleksandr Yuryevich Rumyantsev

Proven Oil Reserves (1/1/01E): 49-55 billion barrels (estimates vary)

Oil Production (2000E): 6.71 million bbl/d; **(2001E):** 7.12 million bbl/d (of which 6.89 million bbl/d is crude)

Oil Consumption (2000E): 2.34 million bbl/d; **(2001E):** 2.38 million bbl/d

Net Oil Exports (2000E): 4.37 million bbl/d (of which 3.8 million bbl/d go outside the FSU); **(2001E):** 4.74 million bbl/d

Major Oil Customers: Europe, Commonwealth of Independent States

Crude Refining Capacity (1/1/01E): 6.6 million bbl/d

Natural Gas Reserves (1/1/01E): 1,700 trillion cubic feet (Tcf)

Natural Gas Production (1999E): 20.8 Tcf

Natural Gas Consumption (1999E): 14.0 Tcf

Net Natural Gas Exports (1999E): 6.8 Tcf

Coal Reserves (1/1/99E): 173 billion short tons

Coal Production (1999E): 276.3 million short tons (Mmst)

Coal Consumption (1999E): 268.3 Mmst

Electric Production Capacity (1999E): 204 gigawatts (68% thermal, 21.5% hydro, 10.5% nuclear)

Electricity Production (1999E): 798 billion kilowatt-hours (Bkwh)

Electricity Consumption (1999E): 728 Bkwh

Net Electricity Exports (1999E): 70 Bkwh

ENVIRONMENTAL OVERVIEW

Minister of Natural Resources: Vitaliy Grigoryevich Artyukhov

Total Energy Consumption (1999E): 26.0 quadrillion Btu* (6.8%) of world total energy consumption)

Energy-Related Carbon Emissions (1999E): 400.1 million metric tons of carbon (6.5% of world carbon emissions)

Per Capita Energy Consumption (1999E): 176.7 million Btu (vs. U.S. value of 355.9 million Btu)

Per Capita Carbon Emissions (1999E): 2.7 metric tons of carbon (vs. U.S. value of 5.6 metric tons of carbon)

Energy Intensity (1999E): 72,133 Btu/\$1990 (vs U.S. value of 12,638 Btu/\$1990)**

Carbon Intensity (1999E): 1.1 metric tons of carbon/thousand \$1990 (vs U.S. value of 0.20 metric tons/thousand \$1990)**

Sectoral Share of Energy Consumption (1997E): Industrial (64.3%), Residential (17.9%), Transportation (17.1%), Commercial (0.7%)

Sectoral Share of Carbon Emissions (1997E): Industrial (64.8%), Transportation (17.8%), Residential (17.4%)

Fuel Share of Energy Consumption (1999E): Natural Gas (54.3%), Oil (19.3%), Coal (16.0%)

Fuel Share of Carbon Emissions (1998E): Natural Gas (50.8%), Coal (26.2%), Oil (22.9%)

Renewable Energy Consumption (1997E): 2,482 trillion Btu* (1% increase from 1996)

Number of People per Motor Vehicle (1997): 6.5 (vs. U.S. value of 1.3)

Status in Climate Change Negotiations: Annex I country under the United Nations Framework Convention on Climate Change (ratified December 28th, 1994). Under the negotiated Kyoto Protocol (signed on March 11th, 1999, but not yet ratified), Russia has agreed to stabilize greenhouse gases at 1990 levels by the 2008-2012 commitment period.

Major Environmental Issues: air pollution from heavy industry, emissions of coal-fired electric plants,

and transportation in major cities; industrial, municipal, and agricultural pollution of inland waterways and sea coasts; deforestation; soil erosion; soil contamination from improper application of agricultural chemicals; scattered areas of sometimes intense radioactive contamination; ground water contamination from toxic waste.

Major International Environmental Agreements: A party to Conventions on Air Pollution, Air Pollution-Nitrogen Oxides, Air Pollution-Sulphur 85, Antarctic-Environmental Protocol, Antarctic Treaty, Biodiversity, Climate Change, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Wetlands and Whaling. **Has signed, but not ratified:** Climate Change, Air Pollution-Sulphur 94.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar and wind electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

**GDP based on EIA International Energy Annual 1999

ENERGY INDUSTRY

Organization: Russia's energy sector is overseen by the Ministry of Energy, except for nuclear power, which is administered by the Ministry of Atomic Energy (Minatom).

Russia's Oil Sector is dominated by large joint-stock companies, although smaller independent producers also produce oil. The major vertically integrated companies include Lukoil, Yukos, Surgutneftegaz, Tyumen Oil (TNK), Tatneft, Sibneft, Slavneft, and Rosneft. Transneft has a monopoly over crude oil transport, while Transnefteprodukt transports petroleum products.

Russia's Gas Sector is dominated by the joint-stock company Gazprom, which is 38% owned by the Russian government. Gazprom produces over 90% of the country's natural gas and also controls Russia's pipeline network. Itera has become a major player in the gas sector as Russia's second-largest gas exporter.

Russia's Coal Sector, formerly operated by RosUgol, a government-owned holding company that was organized along regional lines, has been reformed, with many unprofitable mines closed down and the remaining efficient mines privatized.

Russia's Electricity Sector is operated by the joint-stock company Unified Energy Systems (UES), which is majority state-owned. UES controls approximately 70% of the country's distribution system, 21 thermal power plants, 8 nuclear power plants, and oversees the country's 72 regional electricity companies, known as *energoss*.

Major Producing Oil Fields: Samotlor, Romashkino, Mamontov, Fedorov, Lyantor, Arlan, Krasnolenin, Vatyegan, Sutormin

Major Oil Terminals: Novorossiisk (Black Sea), Tuapse (Black Sea), Primorsk (Baltic Sea); Russia also uses Ventpils (Latvia), Odesa (Ukraine), Klaipeda (Lithuania)

Oil Export Pipelines outside the former Soviet Union: Friendship (Druzhba) (1.2 million bbl/d nominal capacity)

Major Oil Refineries (1/1/01E, capacity: bbl/d): Omsk (566,000), Angarsk (441,000), Nizhniy Novgorod (438,000), Grozny (390,000), Kirishi (388,000), Novo-Ufa (380,000), Ryazan (361,000), Novo-Kuibishev (309,000), Yaroslavl (290,000), Perm (279,000), Ufaneftekhimi (251,000), Salavatnefteorgsintez (247,000), Moscow (243,000), Ufa (235,000), Syzran (211,000), Volgograd (200,000), Saratov (177,000), Orsk (159,000), Samara-Kuibishev (154,000), Achinsk (147,000), Ukhta (127,000), Nizhnekamsk (120,000),

Komsomolsk (108,000)

Major Foreign Oil Company Involvement: Agip, BP Amoco, British Gas, Chevron, Statoil, Conoco, ExxonMobil, Neste Oy, Norsk Hydro, Marathon, McDermott, Mitsubishi, Mitsui, Royal Dutch/Shell, Texaco, and TotalFina Elf.

Major Producing Gas Fields: Urengoy, Yamburg, Medvezh, Orenburg, Severo Urengoy, Vyngapurov

Gas Export Pipelines outside FSU (Capacity): Brotherhood (*Bratrstvo*), Progress, and Union (*Soyuz*) (to Europe, via Ukraine) (1 Tcf each); Northern Lights (0.8 Tcf) (to Europe, via Belarus and Ukraine), Volga/Urals-Vyborg (to Finland) (0.1 Tcf); Yamal (to Europe, via Belarus) (1.0 Tcf); Blue Stream (0.56 Tcf) (to Turkey, under construction)

Major Coal Producing Basins: Chelyabinsk, Kansk-Achinsk, Kuznetsk, Lena, Moscow, Pechora, Raychikhinsk, South Yakutia, Taymyr, Zyryanka

Sources for this report include: CIA World Factbook, U.S. Department of Commerce's Business Information Services for the Newly Independent States, the U.S. Energy Information Administration, Interfax Weekly Petroleum Report, Interfax Weekly Business Report, PlanEcon, Radio Free Europe/Radio Liberty, U.S. Department of State, WEFA Eurasian Economic Outlook, as well as Eastern Bloc research and news reports.

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Contact:

Lowell Feld

lowell.feld@eia.doe.gov

Phone: (202) 586-9502

Fax: (202) 586-9753

URL: <http://www.eia.doe.gov/emeu/cabs/russia.html>

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